FORTY FOURTH ANNUAL FIELD CONFERENCE

OF THE

SECTION OF GEOLOGY

OF THE

OHIO ACADEMY OF SCIENCE

GUIDE TO THE

DEVONIAN STRATIGRAPHY OF CENTRAL OHIO

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FIELD TRIP LOG

Introduction

This field trip gives the opportunity to examine the classic Devonian section in central Ohio, from top down, the Ohio shale, Olentangy shale, Delaware limestone and Columbus limestone. We will not visit the type localities, but we will visit similar nearby outcrops.

In the afternoon we go 28 miles west across Silurian rocks buried beneath Pleistocene drift to the Devonian outlier centered about Bellefontaine. We will examine the unconformity between the Ohio shale and the Columbus limestone at East Liberty.

The formation descriptions below are abstracted from Westgate (1926).

---------- LOG ----------

OWU Parking Lot

North on Henry Street, East on William Street and South at Freeway entrance to route 23.

Go 4 miles on highway 23 to Camp Lazarus, Boy Scouts of America on W side of road. Turn right, and right again into parking lot.

Walk W through camp to creek valley.

The creek valley at Camp Lazarus exposes the Ohio shale, the Olentangy shale, and the Delaware limestone. We will see the lower part of the Ohio shale and the upper part of the Olentangy shale.

STOP 1. OHIO SHALE 600' - 650'

Shale, dense, fine grained, chocolate brown or brown-black, slightly gritty, indistinctly but thinly laminated. Weathers into thin iron-stained plates. Hard and soft bands are well shown where route 36 crosses Alum Creek east of Delaware. The basal 60' section is characterized by dolomite concretions a few inches to six feet in diameter.

These concretions were presumably formed by deposition of dolomite in mud about a center (a bone or plant fragment). The dolomite cemented the mud and the concretion grew in size as more mud was deposited. The mud beyond the concretion was compacted by the weight of overlying sediments, and beds draped over the concretion. The concretion was pushed into underlying beds and bent them downward. Some of these deformed beds have been incorporated into the concretions. (Clifton, 1957)

OLENTANGY SHALE 30' - 35'

Shale, blue-green-gray, high clay content, indistinctly bedded, closely jointed, surface crumbles to small angular debris weathering to gray clay. Pyrite concretions have been found near the base, and limestone concretions occur at intervals throughout the lower part of the section. Thin limestone layers occur near the base and top. Some black shale layers, like those in the Ohio Shale, are in the upper part of the section.

Tillman (1969) has restudied the Olentangy Shale and has distinguished two parts on lithologic and paleontologic grounds. The Upper Olentangy Shale (Upper Devonian) contains the black shale layers and nodular limestone, the Lower Olentangy Shale (Middle Devonian) lacks these. The age distinction is based primarily on a comparision of the ostracod faunas.

---------- LOG ----------

Leave the Scout Camp, go 0.4 mile south on route 23, turn west, go to Olentangy River Road (#315), turn south, and go 3.7 miles to a "wide spot in the road" 200 yards north of an old stone house. Park <u>double</u> and <u>triple</u> off the road on the river side. Walk up an old road to its end in the upper of the "Twin Quarries".

STOP 2. DELAWARE LIMESTONE 40' - 50'

11' limestone, thick-bedded, dark, weathering brown, white chert in upper part.

1' limestone, gray, shaley

5' limestone, massive cherty.

9' limestone, gray medium-bedded, cherty.

8' limestone, grayish brown, with dark chert.

6' limestone, thick-bedded, blue gray, fine-grained. Shale partings and thin beds (1"-4") are common in all layers.

---------- LOG ----------

Continue south on river road, turn east at bridge, proceed to route 23, and retrace route to OWU Science Building.

12 o'clock LUNCH OWU Science Building.

1 PM Leave parking lot, go north on Henry Street, turn west at traffic light on William Street, and proceed out of town on route 36. Go about 4 miles, cross the Scioto River, turn north, go to the village of Warrensburg, turn west, and turn north into the Owen Stone Company Quarry.

STOP 3 COLUMBUS LIMESTONE 80'

38' Klondike member. Ls., buff to gray, fossiliferous, thick-bedded in fresh exposures, weathering to thin-bedded.

6' Spirifer macrothyris zone. Ls., brown, thick-bedded, fine-grained.

6' Coral layer. Ls., brown, thin-bedded, abundant corals and stromatoporoids.

30' Bellepoint member. Ls., magnesian, brown, fine-grained, with flecks of carbonaceous material and crystalline calcite.

6"-1' ls. conglommerate at base.

This quarry is opened in a bedrock "high" underlying the Broadway end moraine. The surface of the limestone has been planed and striated by ice action. The major trend of striae is about S 18^{o} E and at least two episodes

of movement may be discerned. Shallow grooving, crag-and-tail on chert nodules, and solution marks of tree roots are visible. Quarrying operations have exposed some old sinkholes filled with till and residual soil.

---------- LOG ----------

Leave the quarry, turn east to Warrensburg, stop, turn north on the river road (route 257). Stop at the first crossroad and turn west onto route 37.

Follow route 37 west to its junction with 347. Follow 347 straight ahead.

Cross route 4 and route 31. STOP! Be careful!

West of the village of Broadway we ascend the gentle proximal slope of the Broadway end moraine. The steep distal slope forms the northeast side of Mill Creek valley. Mill Creek is a moraine-front stream, flowing along the front of the moraine for many miles toward the southeast.

Continue on route 347 through the village of East Liberty to the East Liberty Stone Quarry on the north side of the road.

STOP 4 COLUMBUS LIMESTONE AND OHIO SHALE

The Columbus Limestone exposed here probably correlates, on paleontologic grounds, with the Klondike member in Delaware County. The lithology is distinctly different. Here the Columbus is almost all dolomitic with abundant chert concretions along the bedding planes.

The Ohio Shale here overlies the Columbus Limestone with marked disconformity. This exposure is available after a lapse of some years when the former exposure had been removed by quarrying.

END OF TRIP. The junction with route 33 is 200 yards west of the parking lot.

REFERENCES

Clifton, H. Edward, 1957 - The carbonate concretions of the Ohio Shale
Ohio Jour Sci 57:114-124.

Tillman, John R., 1969 - The age relations of the Olentangy Shale
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